

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Revisions to Rules Authorizing the Operation)	
of Low Power Auxiliary Stations in the 698-)	
806 MHz Band)	WT Docket No. 08-166
)	
Public Interest Spectrum Coalition, Petition for)	
Rulemaking Regarding Low Power Auxiliary)	
Stations, Including Wireless Microphones, and)	
the Digital Television Transition)	WT Docket No. 08-167
)	
Amendment of Parts 15, 74 and 90 of the)	
Commission's Rules Regarding Low Power)	
Auxiliary Stations, Including Wireless)	
Microphones)	ET Docket No. 10-24

REPLY COMMENTS OF AUDIO-TECHNICA U.S., INC.

Audio-Technica U.S., Inc. ("A-T") submits these reply comments in response to the Commission's *Report and Order and Further Notice of Proposed Rulemaking*, released on January 15, 2010, in the above-captioned proceeding.¹ In the *Further Notice*, the Commission has sought comment on: 1) whether to permit wireless microphones and other low power audio devices in the core TV bands ("WADs") to operate on an unlicensed basis under Part 15 of the rules by entities that are not currently eligible for licensing under Part 74, Subpart H of the rules; 2) whether to adopt technical standards for Part 15 operations patterned on Part 74 standards but

¹ *In the Matter of Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band; Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition; Amendment of Parts 15, 74 and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, WT Docket Nos. 08-166, 08-167, ET Docket No. 10-24, Report and Order and Further Notice of Proposed Rulemaking and Order, FCC 10-16 (rel. January 21, 2008) ("*Order/Further Notice*").

at reduced power levels; 3) whether to expand Part 74 licensing eligibility; and 4) whether to adopt marketing and labeling requirements applicable to Part 15 and Part 74 devices. The *Further Notice* also requested comments on possible long term solutions that would allow wireless microphones to operate more efficiently and with improved immunity to interference from other devices and asks whether Part 90 of the Commission's rules could be revised to better facilitate wireless microphone use.

1. ADOPTION OF TVBD REQUIREMENTS TO PART 15 WIRELESS MICROPHONES

Initially, A-T wishes to address the argument raised in the initial comments of several parties that advocates the imposition of spectrum sensing and/or geolocation capabilities on Part 15 unlicensed wireless microphones.² The gist of this argument is that without imposing equal requirements on both WADs and TVBDs, unlicensed WADs will enjoy a *de facto* spectrum priority over TVBDs. This argument, though having some superficial appeal, is nothing more than a red herring.

The major flaw in the argument is that it does not take into account the very real differences in the way wireless microphones function as compared to other unlicensed devices such as TVBDs. Wireless microphones are inherently different from other devices in that they rely upon a continuous and real-time signal in order to function as required. TVBD technical specifications would not support this. If a TVBD experiences interference, it will merely retransmit the lost data packets with little or no degradation in the final product. In the case of

² Comments of Motorola at pp.4-5 (supports imposition of geolocation capabilities on WADS and removal of spectrum sensing capabilities from TV Band Devices ("TVBDs")); Comments of Dell & Microsoft at pp. 8-9; Comments of PISC at 8-9.

WADs, even minor interference can result in significant performance degradation. Additionally, as noted in A-T's initial comments, the addition of search and detect and geolocation capabilities to WADs would be highly cost prohibitive and could not be supported based on current battery technology. The battery power required for audio dynamic range performance is substantial and such capabilities would severely drain limited battery power needed for WAD operations and would shorten battery life to the point where a WAD would become unusable in a typical application or configuration.

Without trying to be overly cynical, A-T suspects that the TVBD advocates are not really interested in requiring WADs to be equipped with geolocation or spectrum sensing capabilities but are instead using this argument merely as leverage to convince the Commission to remove at least the spectrum sensing obligations that the Commission has mandated for TVBDs. In fact, the comments cited earlier, and to which this reply is addressed, have specifically asked the Commission for exactly that relief. If those commentators do not feel that spectrum sensing is appropriate for TVBDs, then they cannot credibly claim that such obligations should be imposed on WADs.

A-T would also note that only fixed higher power unlicensed TVBDs are required to register with the geolocation database.³ Personal/portable TVBDs are not required to do so regardless of whether they operate in Mode I or Mode II configurations.⁴ Given that fixed TVBDs will operate at power levels of up to 4w EIRP, as compared to a maximum authorized

³ *Second Report and Order and Memorandum Opinion and Order*, 23 FCC Rcd 16807, ¶¶ 108, 114 (2008) (*TV White Spaces Second Report and Order*) recons. pending.

⁴ *TV White Spaces Second Report and Order* at ¶ 124.

power level of up to 50 mW for an unlicensed WAD, the likelihood that a fixed TVBD will experience interference from the unlicensed WAD is miniscule, and the very presence of fixed station operations at those higher power levels will render those channels totally unusable for unlicensed microphone use without those microphones having to query the geolocation database. Likewise, since portable TVBDs will not be licensed, and are not required to register with the database, these devices will not receive any additional protection should unlicensed WADs be equipped with geolocation capability. Unlike TVBDs, wireless microphones have an established track record of operating in the TV Bands without causing interference to licensed services and there has been no showing whatsoever to support the imposition of geolocation requirements on WADs.

The fact is that TVBD advocates loudly touted the spectrum sensing and geolocation capabilities of their devices and repeatedly insisted that these capabilities would guarantee the ability of TVBDs to operate in the TV Bands without interfering with existing licensed services, including wireless microphones. Now, without having deployed these devices, TVBD advocates are claiming that spectrum sensing is no longer needed and represents an unnecessary manufacturing cost. A-T wonders if this abrupt reversal on the issue of spectrum sensing reflects the fact that spectrum sensing technology, while holding genuine promise for the future, is simply not yet ready for prime time—a concern raised by A-T in its comments in the Commission’s White Spaces proceeding.

2. DIGITAL WIRELESS MICROPHONES

Several commentors suggest that mandating a transition to digital wireless microphones would be more spectrum efficient, or that wireless microphones would work better if

manufacturers were given an incentive to move to “all-digital” wireless systems.⁵ This is simply not the case. Wireless microphones are a mature (more than 10 years) market application, with vigorous competition leading to continuous technical improvement of the product. If an all-digital wireless microphone were a complete solution, the top manufacturers would have moved to this solution based upon market demand. Instead, the market first demands a certain level of performance. Digital technology simply does not currently support all required performance parameters when one takes into account the numbers of simultaneous channels in use at a specific venue and required audio and battery performance. In fact, manufacturers and professional end users have become very adept at managing to fit numerous channels of traditional analog FM wireless into very limited bandwidth without interference to local or nearby systems. As Shure points out in its comments, studies undertaken by the European Telecommunications Standards Institute (ETSI) demonstrate that a digital wireless microphone can actually require more bandwidth than analog operations and that digital microphones are actually susceptible to more rather than less interference relative to analog transmissions.⁶ Indeed, even opponents of allowing unlicensed wireless microphone operations in the TV Bands acknowledge that digital microphone technology is not presently a panacea for interference and bandwidth concerns.⁷

⁵ Comments of Dell & Microsoft at pp.12-13; Comments of PISC at p.5.

⁶Shure Comments at p. 28.

⁷ EIBASS Comments at p. 8.

3. PART 74 TECHNICAL STANDARDS

Several commentors have raised concerns regarding the technical standards to be applied to unlicensed WADs under a proposed expansion of Part 15 of the rules. For example, Shure advocates the adoption of ETSI standards used in Europe for out of band emissions.⁸ Likewise, television broadcasters have raised concerns about the possible proliferation of inexpensively made “toy-like” audio devices for the sake of consumer convenience under a revised Part 15 that could interfere with television reception in the home.⁹

As indicated in A-T’s initial comments, the adoption of existing Part 74 technical specifications with a 50mW output power restriction and re-certification requirement for Part 15 WADs will ensure that the quality and performance of the WADS will remain as it is now. There has been extensive experience with unlicensed microphones operating in the television bands under Part 74 standards and that experience has demonstrated that these devices are the likely recipients of interference from other sources and not the causes of such interference. The quality of manufacturing required to meet Part 74 technical standards and the limits on authorized power levels should be more than sufficient to prevent the proliferation of inexpensively manufactured interference causing toys and baby monitors as feared by broadcast interests.

The adoption of Part 74 technical standards as they now exist, including existing emissions standards, ensures that the existing embedded base of unlicensed equipment, having been manufactured to meet Part 74 standards, will be continue to operate in compliance with the

⁸ Shure Comments at p.29.

⁹ MST and NAB Comments at pp.8-10.

new standards and avoids the problems and costs that would otherwise be incurred if different or additional standards were imposed on Part 15 users. The adoption of different or additional technical standards for unlicensed users would require the Commission to deal with a large embedded base of unlicensed devices that are currently deployed and in use throughout the country that have been manufactured to meet existing Part 74 standards. The costs of doing so would be high while the corresponding benefits, if any, would be low, especially in light of the fact that these devices have been operated successfully over a number of years on an unlicensed basis without causing harmful interference to other products and services.

Adopting the remaining Part 74 technical standards unchanged for Part 15 devices will make it easier and less costly for manufacturers to quickly and seamlessly provide wireless microphones to unlicensed end users that meet suitable performance and price requirements and, on a going forward basis, it will make it easier and less costly for end users to transition between licensed and unlicensed use based on changing needs and circumstances. It will also make it easier and more cost effective for equipment manufacturers to re-certify existing wireless microphone models for Part 15 use. If the Commission were to adopt revised technical specifications for Part 15 WADs, this could require complete redesign and retesting of substantial numbers of WAD product lines that would impose significant costs and time delays (up to 3 to 5 years for product design, testing and certification and distribution) upon manufacturers, consumers and Commission staff.

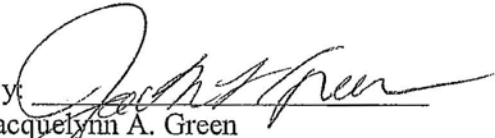
V. CONCLUSION

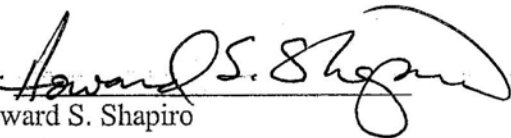
Based on the foregoing, A-T respectfully requests that the Commission authorize unlicensed wireless microphone use under Part 15 of its rules on a permanent basis; adopt part 74

technical standards as they presently exist for wireless microphones authorized to operate under Part 15 at power levels not to exceed 50 mW; adopt reasonable labeling and disclosure requirements for Part 15 and Part 74 devices as part of the equipment certification process; and expand Part 74 licensing eligibility to include the categories of wireless microphone users that are eligible for licensing under Part 90 of the Commission's rules.

Respectfully submitted,

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